



# Beryllium Health and Safety Committee

Kathy Creek, Committee Chairman  
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## Meeting Minutes

November 3, 2003

DOE HQ Forrestal Facility, Washington DC

### Meeting Minutes:

Kathy Creek, Dave Weitzman provided the welcome, J. McKenney went on an overview of the last meeting minutes.

### Kathy Creek – Announcements, Old Business:

#### **Announcements:**

The beryllium community has been informing the BHSC that the 2ug OSHA limit is protective. This is of concern, because there have been documented cases of exposure when under that limit. Kathy suggested having a symposia that invites the international community to hear the presentations that are given at the BHSC meetings. This would enable the community to participate in a more international setting. Any volunteers for a potential conference community were asked if they could dedicate the time and had the support of their respective organizations.

#### **Old Business:**

The research needs priority list was finalized, with significant help from David Weitzman. DOE Headquarters has expressed significant interest in the list (more to follow in D. Weitzman's presentation).

### David Weitzman – DOE/NNSA Beryllium Research Program:

David Weitzman recapped the briefing for the assistant secretaries. The presentation covered sensitization rates versus CBD cases, and compared current vs. former workers. The "New" CBD cases first known beryllium job is after 1998. 1 new case was found at the KC plant, 1 at the Nevada Site Office, 7 at Y-12, and there may be others. It was discussed that the Registry data is sketchy, and that the data from Y-12 may be wrong.

Limited research is underway. Much of the key research is ad hoc. There is no dedicated funding. We need a research community that is both interested and qualified and has the institutional support required to provide a competent effort.

Estimated research needs costs were projected at approximately 14.6 million dollars over a period of 4 years, with a ramp up effort and a close out period.

Potential next steps include workshops to include identification of knowledge gaps.

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The assistant secretaries were given the opportunity to identify funding for the well defined needs. There was consensus that the secretaries were convinced that funding streams would need to be identified and eventually have money released. The report and presentations would be posted on the web site.

#### **David Weitzman –Beryllium Release Criteria:**

David updated the committee on the reports that were associated with the beryllium release criteria. These reports will be posted on the web.

#### **Mandy Eden – OSHA Beryllium Rulemaking**

Mandy updated the group on the status of the rulemaking activities. The major rulemaking activities recently involved site visits. 7 sites were visited, including machining, recycling, and other beryllium processing activities (dental labs, aerospace, etc.) The principle goals of the activities were to develop process and control information, including for the worker. Significant sampling was done to accommodate these goals.

Michael McCawley updated the committee on the types of sites that were visited and some of the basic activities that the sites engaged in.

#### **Dr. Deanna Harkins – DoD Iowa APP Study:**

Dr. Harkins updated the committee on the DoD Iowa APP Study. This study was a result of the congressional direction to the secretary of defense mandating that a review of exposed DoD workers was undertaken and that workers were to be notified.

Dr. Harkins discussed issues and problems with methodological inconsistencies and briefed the committee on the difficulties that were encountered.

Past workers = 38000 (since 1941) approx 33%  
Current workers = 1000

Past data quality is weak, and is being evaluated to determine what is useful and what needs to be potentially revisited.

#### **Tony Quinn – Next Meeting:**

Tony Quinn discussed the location and proposed topics. Dates – April 27 – 29 (Tuesday, Wednesday, and Thursday).

We need confirmation of the attendees 6 weeks before the actual date (confirm with Tony)

Tuesday and Wednesday – BHSC Meeting

Venue – Aspects Learning (AWE Training Centre)

Thursday Morning – Visit to ASE Beryllium Facility (Security Cleared Personnel only)

Thursday Afternoon – Wash-up Meeting, Aspects Learning

Friday 16/23/30 April, possible visit to JET at Culham Labs

Contacts:

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**Dr. David Deubner – Sensitization to Beryllium: Different views from studies using the Beryllium patch test and Beryllium Blood Lymphocyte Proliferation Test:**

Dr. Deubner briefed the committee on what the studies using the beryllium patch test and the BeBLPT might be telling us.

A prevalence study using the BeBLPT is somewhat of an enigma. In the largest prevalence survey of Be workers found the rate of positive BeBLPT was level over a wide range of years worked with beryllium.

Also, in the Tucson 1998, Elmore 1999 and Reading 2000 surveys we learned that people between 4 and 8 months of employment had a much higher prevalence of positive BeBLPT's.

Through two surveys and ongoing testing, the cumulative % rises with time while the prevalence in each survey remains flat.

You can get a rising cumulative percentage (cumulative incidence) and a flat prevalence in 3 ways:

- Persons who become BeBLPT positives are removed from the population (people get sick and choose to leave work)
- Being BeBLPT positive is a temporary (but possibly recurring) condition, or
- Both of the above

Can the Be patch test BePT literature help us understand this?

- Curtis 1951: Cleveland Clinic dermatologist:
  - At least 8 of 16 volunteers (50%) developed positive BePTs on one application of multiple beryllium salts to the skin.
  - Data was shown from the Curtis 1951 tests
- Shima 1973: Doctor working with NGK
  - Experienced beryllium workers gave 100% positive BePT (beryllium salt)
  - Up to 80% of new workers with highest exposures developed BePTs in the first year of work
  - Data was shown from these tests

Patch test positivity for healthy Be workers in each working process during one year was proportional to the amount of Be in the air, showing that the BePT was not the cause of sensitization.

## Value of the BePT and the BeBLPT

- Primary immune response
  - BePT: Good sensitivity and specificity
  - BEBLPT: Poor sensitivity and very good specificity
- CBD
  - BePT: Poor positive predictive value in Be workers
  - BeBLPT: Good positive and negative predictive value in Be workers

## Beryllium immune response:

- The BeBLPT may be viewed as a marker of immune activation or “up-regulation” of the immune response.
- The BeBLPT is an unreliable of beryllium exposure and sensitization, but when positive is a relatively good indicator of the likelihood of CBD

## BeBLPT in groups without definite exposure to beryllium

- When most persons in the group have not had exposure to beryllium, a high proportion of BeBLPT positive persons represent the population background rates (false positives)

## Beryllium exposure and sensitization

- Beryllium exposure:
  - With sufficient skin or lung exposure, all or almost all will have a primary immune response (become sensitized)
- Sensitization markers
  - “All” will develop a positive BePT
  - “Many” will develop a positive BeBLPT
    - In “most” the positive BeBLPT is transient
    - “Some” will have up-regulation of the response in a variety of patterns indicated by variably positive BeBLPTs over time

## Sensitization Markers and CBD

- Persons with positive BeBLPTs have a high probability of having typical inflammation in the lung
- Some of these will develop significant progressive clinical disease
- Clinical course of the rest is in doubt

## CBD Enigma:

- Through two surveys and ongoing testing, the cumulative% rises with time while the prevalence in each survey remains flat (as discussed previously)
- How do we explain this?
  - One possible explanation is that in the mildly sensitized population that the granulomas are also transient.

## Natural history of sub-clinical CBD

- Epidemiology suggests, as for the positive BeBLPT, that sub-clinical lung inflammation may be a temporary condition in some, in analogy to sarcoidosis
- “Sarcoidosis runs a variable course, with the disease resolving spontaneously in many patients”.
  - Sirling RG, Cullinan P, and Du Bois

What if all of the above were true?

- Interpretation of research
- CBD a 4 step process
  - Primary immune response
  - Immune activation
  - Inflammation
  - Progressive Fibrosis

Step 1 - primary immune response BePT: Only Curtis and Shima have adequately studied this

Step 2 - activation BeBLPT: Current epidemiology studies this but lack of a clear dose response means that it may not be related

Step 3 - inflammation, biopsy: Current epidemiology shows closely linked to activation except:

- Higher population inflammation activation in BeO work
- Lag in proportion years 1, 2, 3
- Dissociated in BWI mine and ore processing? Due to no BeO exposure?

Genetics of activation and inflammation

Step 4 - progressive fibrosis (serious illness)

- Epidemiology is not known
- Numbers much smaller, diagnoses accumulate over long periods
- Dissociated in BWI mine and ore processing. (Due to no BeO exposure?)

Implications for research:

- BeBLPT negative groups should not be labeled as “not sensitized”
- There has to be a clear delineation of the relationship of hypotheses to the different outcomes (sensitization, activation, inflammation, or progressive fibrosis).

Dr. Deubner fielded questions regarding the briefing and closed.

### **Mike Brisson – Analytical Sub-Committee Discussion**

Mike gave the committee a summarized brief of his talk that will be presented on Wednesday. This pertains to the integration of Analytical techniques into the BHSC, potentially as a new sub-committee.

The committee collectively discussed the matter, bringing several relevant discussion points to the floor. When this presentation was discussed before the analytical managers, there was strong support for the formation of this group. It was collectively decided that this would be a separate group from the Technical Practices, Standards, and Measures Subcommittee. The committee appointed Mike as the chair of this new committee and sanctioned the formation of the new subcommittee.

## **J. Slawski/P. Wambach – DOE/Nevada Beryllium Exposure Final Report**

Investigation of Beryllium Exposure Case discovered at the Nevada site.

(\*this report will be posted on the [www.sandia.gov/BHSC](http://www.sandia.gov/BHSC) website

Jim Slawski briefed us on the team members.

### Facility Information:

North Las Vegas facilities provide support to NTS and other NNSA/NSO activities such as the Remote Sensing Laboratory

Bechtel Nevada is the M&O contractor responsible for site operations and is landlord for both NLV and NTS

IT/Shaw is M&O contractor funded by EM to conduct characterization

### Initiating Events:

- March 2002 NSO notified of an IT/SHAW employee with CBD
- During April – June 2002, several cases of Be sensitization found, about seven cases had no plausible exposure history
- Building B1 in NLV, where many of the cases resided had contained a machine shop before 1994. Occasional beryllium work was done in shop. Buildings B1 and B3 were converted to offices in 1995.
- Surveys of building and related buildings found low levels of Be contamination, well below current standards
- Multiple subject matter expert reviews could not resolve the issues.
- Concerns were raised about the adequacy of current beryllium standards
- NNSA chartered this investigation on August 22, 200 at request of NSO

### Team Conclusions

- Team concluded that the beryllium in the buildings had most likely resulted from the inadvertent transport of contamination and contaminated articles from NTS to NLV
- Team concluded that the CBD case may have been exposed while conduction remediation surveys at contaminated NTS facilities
- Team concluded that all sensitizations with no plausible exposure histories could be correlated with contamination in buildings and/or with handling of contaminated articles or documents
- Team concluded that there is likely to be unrecognized residual contamination at multiple sites on NTS, and there is ample opportunity for personnel to unwittingly traverse these areas.
- Team concluded that postulated exposure conditions would be adequate to cause the effects observed (ergo, cases do not challenge current standards).

### Investigation Findings:

- Medical evaluations of CBD and sensitizations were validated
- Absence of prior exposure histories was validated for most cases
- Contractor surveys of buildings had not considered all possible exposure pathways – team directed new, intrusive surveys after relocating personnel from buildings

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- Team found widespread contamination, above standards, in first floor carpets and in high bay of B1; some contamination also found on second floor and in other related buildings (B2, B3, A1)
- Team found no association of contamination with former machine shop
- Contamination patterns indicated that beryllium had entered the buildings through doorways and on documents and/or articles

Jim Slawski presented the data from the investigation findings to the committee, noting that the first floor of building B1 sampled significantly higher levels of Be than other locations (see page 24 of the report)

#### Investigation Findings (cont.)

- Team found that historic records indicated an extensive use of beryllium at NTS, often creating significant contamination
- IT/SHAW personnel in B1 were doing environmental characterization of many of these areas between 1997 – 2002.
- BN personnel in B1 were visiting these areas and collecting and archiving historic documents and articles in the same time period
- BN personnel in B3 also had occasional need to visit NTS and these areas
- Be contamination had not been recognized as a potential concern at most of these areas, therefore not routinely monitored
- Team found that there was no NSO or Contractor corporate awareness of Be related activities at NTS, even though records existed
- Team found that postulated exposure scenarios in this event were similar to those documented in other CBD scenarios.

#### Causal Factors

##### Direct Cause:

- Personnel were unknowingly exposed to particulate Be contamination in their work areas, resulting in a diagnosis of CBD for one individual and multiple individuals diagnosed with beryllium sensitization

##### Judgments of Need (see page 12 – 18 of the report)

- 18 JON's identified

Additional NNSA actions were also identified (see report)

#### **George Fulton – Recommendation for Skin Protection in the Beryllium Work Environment**

George gave an overview of the project compilation on recommended skin protection protocols for the beryllium community. The author is the CBD Prevention Sub-Committee of the BHSC. The document covered adequate PPE, such as potential uses of change rooms, full body clothes, adequate glove, shoe covers, etc.

The document is estimated to be available by the next BHSC meeting. Kathy Creek requested that George Fulton e-mail the document to her and that the document would be distributed via e-mail (not posted on the web) for comment and then finalized at the next meeting.

### **Kathy Creek – Discussion on Sub-Committee Constituency**

The committee discussed the possibility of balancing out the committee with the added presence of the medical community.

We reviewed the defined roles and responsibilities as last defined, and consensus was reached that we need to target physicians and other members of the beryllium medical community.

Debbie Hurst of the Y-12 beryllium surveillance program was asked to make contact with some of the members of the medical community to request their attendance and participation in the BHSC. It was discussed that without a well defined leader of this sub committee, it would be difficult to stabilize an additional subcommittee. Kathy Creek will investigate the potential of this subcommittee.

Additional discussions regarding the potential Beryllium Coordinating Committee (BCC) and the potential reformation of the entity transpired. Presently, there is discussion of the legality of the committee and the Federal Advisory Committee Act (FACA) ramifications if the BHSC were to take a more proactive role in the process. The origin of the BCC was a closed meeting comprised of Federal employees and AWE employees. It was discussed that while most of a potential reformed BCC's duties would revolve around supply, they would certainly need to review the health and safety aspects.

Kathy Creek officially designated the formation of the Medical and Epidemiology Sub-Committee.

David Weitzman

There was a request for a Lessons Learned Database. This was implemented and can be accessed from the <http://eh.doe.gov/ll/lldb>

The committee broke out into the subcommittees, including the new Analytical Sub-Committee. The groups were to discuss potential issues, targeted goals, status, membership, etc.

The groups kept separate minutes of their meetings.



# AGENDA

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## Beryllium Health and Safety Committee Meeting/Workshop Washington, D.C./November 3, 2003

Forrestal Building-Room Number: Small Auditorium, GJ-015  
Teleconferencing Call-in number: +1 (301) 903-6202 (8-5 EST)

8:30	Welcome	K. Creek, D. Weitzman
8:45	Overview of last meeting minutes	J. McKenney
9:00	Announcements, Old Business	K. Creek
9:10	DOE/NNSA Beryllium Research Program	D. Weitzman
9:15	Beryllium Release Criteria Guidance	D. Weitzman
9:30	OSHA Beryllium Rulemaking	M Eden
9:45	DoD Beryllium Operations	TBD
10:00	Break	
10:30	Sensitization to Beryllium: Different views from studies using the Beryllium patch test and beryllium blood Lymphocyte proliferation test	D. Deubner
11:30	Lunch	
1:00	DOE/Nevada Beryllium Exposure Final Report	TBD
1:30	Y-12 Beryllium Monitoring	M. McCawley
2:00	New Business - Skin protection guidance - Subcommittees (medical, analytical) - Low % beryllium materials	All
4:30	Wrap-up	K. Creek
5:00	Adjourn	

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